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A Review on Structural Wood I- Joists Section

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Abstract— *In this review paper to analysis of the structural wood –I joist section also determine the bearing capacity of I – Joist section. In a circular holes in the webs of wood I – Joists for the remediation techniques used for evaluation. In this review study also investigation of elastic tensional Buckling capacity of wood I –Joists.*

I. INTRODUCTION

Wood composite I-joists represent a sizeable portion of new residential construction floor systems. I-joists are created from solid sawn, or more commonly, structural composite lumber (SCL) flanges connected with an oriented strand board. As the complexity of residential housing increases, wood I-joists are being used in various configurations, including longer span distances and continuous and cantilevered beams. The OSB web element constitutes a thin walled structure.

II. LITERATURE REVIEW

1. Rémi St-Amour, Ghasan Doudak (2017):- In this paper the elastic lateral torsional buckling capacity of wood I-joists. A sensitivity analysis determined that the orthotropic material properties that affect the critical buckling load of wood I-joists are the longitudinal modulus of elasticity, The transverse shear modulus of the flanges and the elastic modulus of the web.

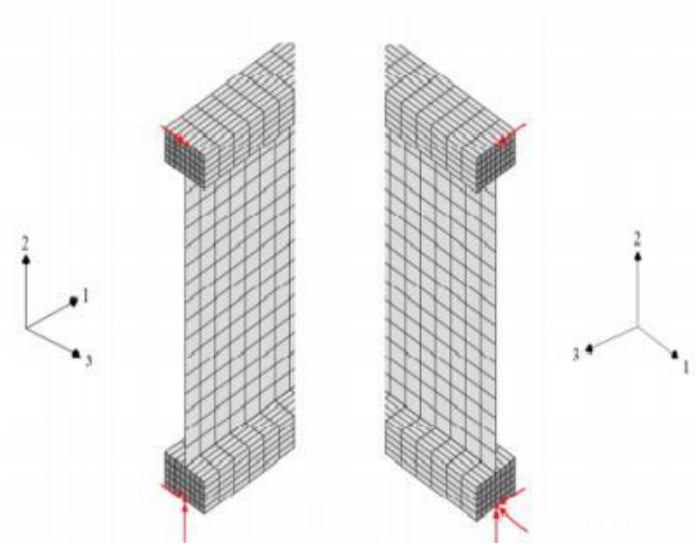

Fig. 1: Inactive Translational Dofs (Red Arrows) at Each End of A Simply Supported Wood I-Joist, Rémi St-Amour, Ghasan Doudak, 2017

Fig. 2: I-Joist Torsional Rigidity Test Configuration for Whole I-Joist, Rémi St-Amour, Ghasan Doudak, 2017

2. Amjad Islam, Tatek Debebe, Stephen U. Nwokoli (2011):- In this research study the bearing capacity of wood based I-joists was analyzed. To determine the bearing capacity of I-joists by using the finite element software.

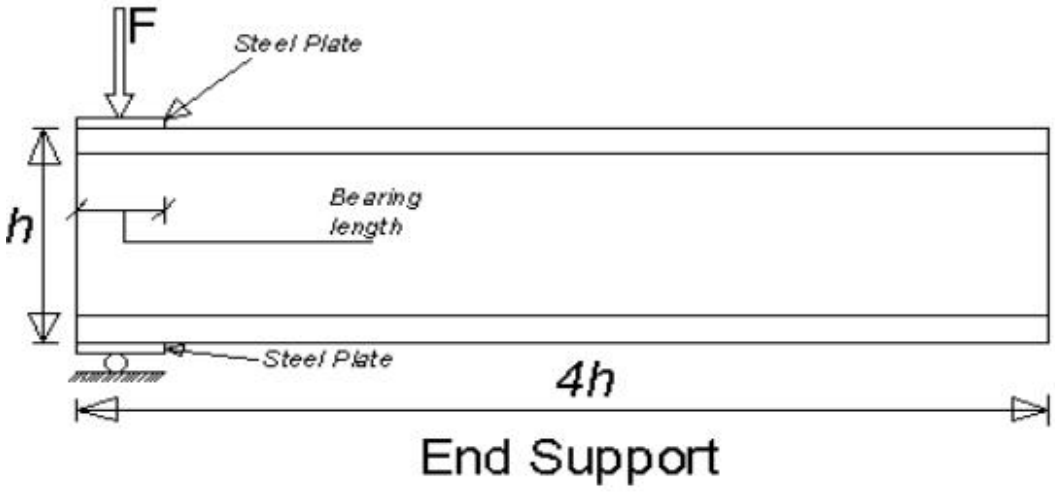

Fig. 3: Support And Load Conditions, Amjad Islam, Tatek Debebe, Stephen U. Nwokoli, 2011

3. Rémi St-Amour (2016):- In this study on experimental investigation on material properties and critical buckling load of 42 wood I - Joist. FE model is used to reproduce the nonlinear buckling behaviour of the wood I- joist and provide an accurate estimate of the lateral torsional buckling capacity using the linear buckling analysis.

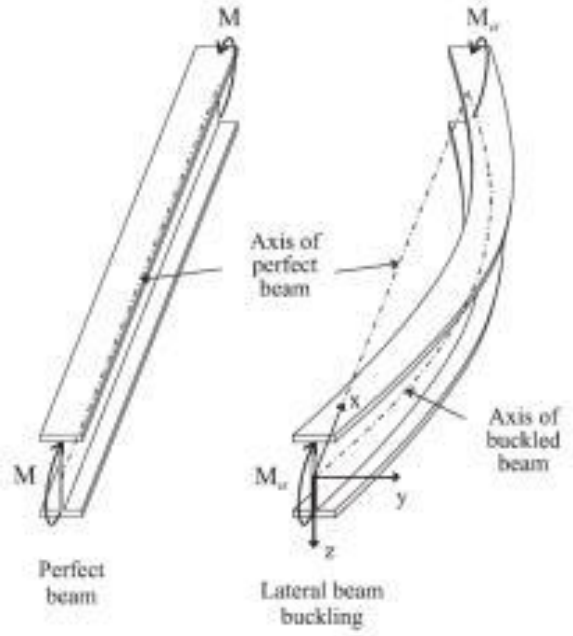

Fig. 4: I- Section Undergoing Lateral Torsional Buckling, Rémi St-Amour, 2016

4. Tiberiu Polocoser, Thomas H. Miller, and Rakesh Gupta (2013):- In this paper was to Evaluate of Remediation techniques for circular holes in the webs of wood –I Joists. Seven remediation techniques was investigated initially and remediation effectiveness was evaluated on the basis of Strength, Stiffness and ease of installations cost.

Fig. 5: Examples of Holes In Wood I-Joists, Tiberiu Polocoser, Thomas H. Miller, And Rakesh Gupta, 2013

5. Benoît Pelletier (2017):- To investigate the lateral torsional buckling of wooden I-joists.In a numerical 3D model was also developed using commercially available finite element program ABAQUS to determine the buckling loads and associated mode shapes of joists similar to those tested. In a FEM model was capable of

predicting the buckling load of wood I-joists with various end conditions and initial imperfections with reasonable accuracy.

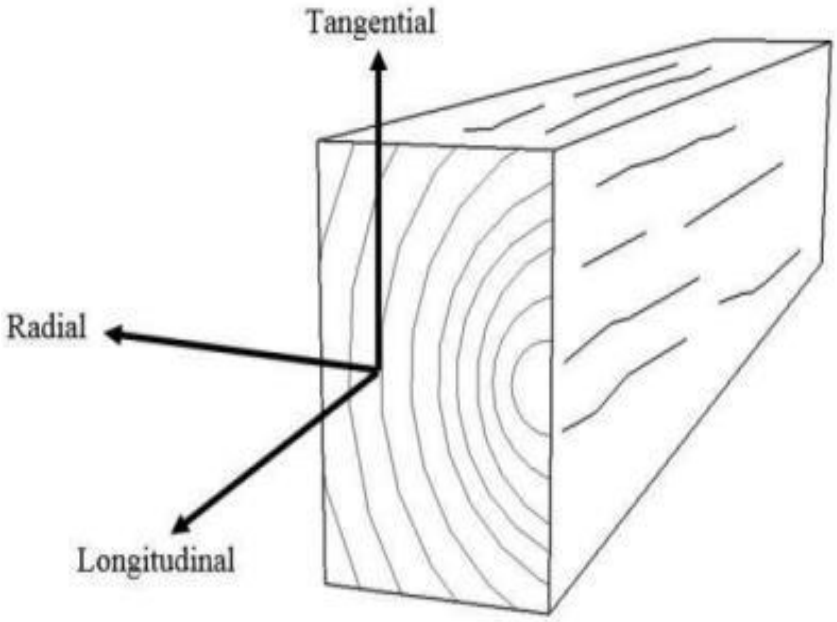

Fig. 6: Wood Orthotropic Principal Axes, Benoît Pelletier, 2017

6. Joseph A. Yura (2001):- In this paper is to be provide a fairly comprehensive view of the subject of beam stability bracing. The following factors that are affect bracing requirements will be discussed and Proposed design method.

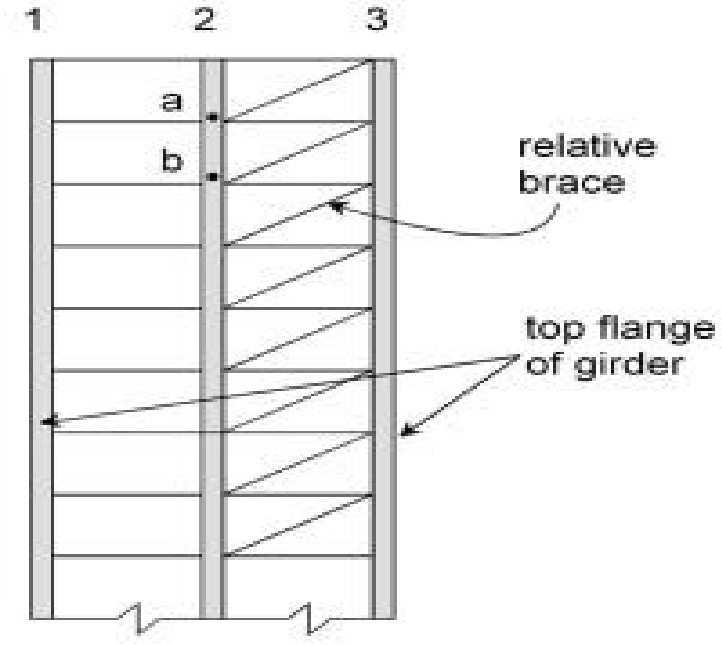

Fig. 7: Relative Bracing, Joseph A. Yura, 2001

7. Patricio quintana gallo and david carradine (2018):- In this review study to cover experimental / Numerical research and built applications connection between element and design methodology related to hybrid timber structures.

Fig. 8: Single Hybrid Frame Type, Patricio Quintana Gallo and David Carradine, 2018

III. CONCLUSION

In these review studies of structural wood I- joists section to analyze the behaviour of Wood –I Joist Member and also the properties of Wood I- Joists Section.

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